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BY

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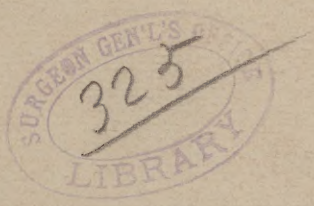
REPRINTED FROM

The New York Medical Journal

for November 12, 1887.



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REPORT OF A CASE OF TUBERCULAR PHTHISIS TREATED WITH THE PNEUMATIC CABINET.

By WILLIAM B. WOOD, M. D.

This paper does not enter the field in which the pneumatic-cabinet treatment has yielded the most valuable results—which is in the control and cure of the earlier stages of pulmonary affections—but is simply a record of what it is possible to do with the graver forms of established pulmonary diseases, to give relief and comfort, and to at least prolong life; not merely to extend an existence of chronic invalidism, but frequently to prolong life with such improvement of health as enables a patient to resume the regular daily occupations.

On the 23d of April, 1887, a gentleman, about forty years of age, presented himself at my office for examination. He had just returned from a winter in Florida, where he had experienced steady, and for two months rapid, decline. His case proved to be a typical one of tubercular phthisis. Every one of five specimens of sputum examined contained bacilli in very unusual numbers. There were broncho-vesicular respiration in the right lung from the third interspace to the apex; crepitant

râles in the clavicular region; moist râles and softening at the apex. There were creaking friction-sounds; the percussion notes were those of thickened and adherent pleuræ, with some consolidation; there were also infra- and supra-clavicular retraction. In the left lung crepitant râles were heard from the clavicle to the apex. The rational symptoms were such as always accompany the foregoing physical signs: restless nights, racking cough, alternate hectic and clammy stages, the septic expression and complexion, shortness of breath, lack of appetite, loss of digestive and assimilative power, with daily expectoration of from eight to ten ounces, and a progressive loss of vitality, weight, and lung.

At this time the patient was unable to accomplish normal respiration with sufficient vigor to meet the natural demands of waste-repair and up-building.

By normal respiration is meant, of course, the act of filling the lungs in inspiration with pure air and deoxygenated blood, and in expiration that of emptying them of deoxygenated air and oxygenated blood, thus supplying red blood to medulla, mesentery, and mucous membranes. As I knew of but one process—the pneumatic differentiation —which could accomplish this, treatment in the cabinet was recommended as a means of temporary amelioration certainly, and possibly of permanent benefit.

The degree of success to be obtained with the pneumatic cabinet depends largely upon the individualization of the various cases and the fine adaptation of its functions to the age, sex, particular disease, and general physical condition of each patient. The personal equation of the operator is also a most important factor. The results to be obtained by the cabinet depend upon the operator's skill. It is a powerful instrument, but so mathematically exact that it may be perfectly controlled, while its several distinct and separate functions make it an instrument of great scope and power of combination; but those who expected

the cabinet, *per se*, would work miracles, have been disappointed; its results, like those of a surgeon's knife, indicate the skill, little or much, that manipulated the instrument.

In all pneumatic-cabinet work an antiseptic and bacillicide spray is used. The breathing tube is kept filled with this spray always, in all treatments. The cabinet itself, and all towels, tubes, and other appliances, are, after each treatment and for every patient, disinfected with bichloride solutions.

With the patient referred to the treatments were begun April 24th. They were given daily and were progressive in the degree of rarefaction and pressure used, as well as in duration of time. The increased breathing capacity which is acquired in a single treatment will be retained after leaving the cabinet for from twelve hours to weeks or months, according to the patient's condition. In the present case the duration of the first treatment was three minutes; as the patient's condition improved gradually with each treatment, this was increased, until at the end of three months he could with advantage take from fifteen to twenty minutes.

In the first three treatments forced inspiration* was used with a rarefaction of three tenths of an inch to one inch.

To produce forced inspiration, the patient is shut in the cabinet; the pressure of the air about him is reduced by rarefaction, which causes the lungs to expand; he is then allowed to fill his expanded lungs with the denser atmospheric air at equilibrium, supplied to him through the tube from without the cabinet, and saturated with antiseptic spray, the expirations being made into the rarefied air of the cabinet.

Each treatment began with a series of these forced inspirations, included residual air expansion, and was followed by an-

* Dr. H. F. Williams, "Jour. of the Amer. Med. Assoc.," May 7, 1887.

other series of forced inspirations combined with forcible expirations—that is, the patient, after having filled his expanded lungs with the current of air inflowing through the tube, breathes out against the force of this current. This act condenses a certain amount of the bacillicide spray within the lungs. The power to make a forcible expiration against an opposing current can be cultivated only gradually, and must be carefully proportioned to the patient's strength.

In one week this patient could without fatigue take this inspiratory differentiation for five minutes under a rarefaction of four tenths of an inch. By the end of the second week he could walk one mile, eat beefsteak, and sleep without the disturbance of cough and sweats.

During the third week the patient was able at the close of each treatment to take for one minute full pneumatic differentiation, which is to breathe in under rarefaction and out under pressure, and thus to receive re-enforcement of power in both inspiration and expiration. This compound act is the test of circulatory and pulmonary capacity. It should at first be used with but two tenths differentiation each way, and only for one or two minutes a treatment. When a patient has acquired lung power enough to take full pneumatic differentiation without fatigue, for from one to three minutes under re-enforcement of six tenths to nine tenths of an inch each way, he soon breathes normally without this assistance.

The patient could now in the third week sleep without waking eight hours a night, walk two or three miles a day, and eat and digest well, showed red blood in the tips of his ears, and expectorated only three to four ounces instead of eight to ten.

At the fourth week the man began to gain in weight, and gained a pound a day for seven days.

At the beginning of the second month the lung gave vesicular respiration without râles or friction sounds up to the supra-clavicular space; the infra- and supra-clavicular areas were fuller. After treatment, the broncho-vesicular breathing was confined to the very apex; before treatment it would extend down almost to the clavicle. All crepitant râles had now disappeared from the left lung.

From June 27th to July 5th no treatments were given. The patient "missed the cabinet badly." When treatments were re-commenced, it was at an altitude of 1,800 feet above the sea. Here an item of importance developed itself. I found that the patient needed to be acclimated to the diminished atmospheric pressure under which he then was; that, although his condition was as good as in previous treatments, three weeks were needed before he could safely bear the same pressure and the same length of treatment which, in New York, had caused no inconvenience.

I think clinical observation will show this to be the rule and not an exception, and that any patient going from sea level to any considerable altitude, whether he has or has not had cabinet treatment before the change, must be managed with great care, and that it will be some weeks before he can obtain progressive benefit from the cabinet.*

The treatments at an altitude were given daily until September 1st, and then discontinued until October 15th. The slight inconvenience experienced by the patient during this intermission, as compared with the serious discomfort caused by the shorter intermission in June, is evidence that something more than temporary amelioration can be effected by cabinet treatment in even graver forms of established pulmonary diseases. Examination revealed more accurately the degree of permanent gain.

The patient showed an increase in weight of six pounds, slept *all night* without waking, and expectorated on an average only half an ounce daily. The whole upper right lung gave softer and stronger respiratory murmur, the broncho-vesicular element was confined to the apex, and the evidence of softening had disappeared.

In the left lung no signs of disease remained.

* Dr. Alfred L. Loomis, "N. Y. Med. Journal," June 12, 1886.

There has been no abnormal temperature, chill, or night-sweats since June.

Of a large number of specimens of sputum examined, about one half showed no bacilli; the others contained occasional bacilli scattered at intervals. But there is now not one where there were a thousand in the April specimens.

The patient is now, November 1st, walking from three to eight miles a day.

17 East Thirty-eighth Street, *November 1, 1887.*

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